1999 NEC

ELECTRICAL CODE AMENDMENTS

Ordinance No. 3413

effective March 8, 2002

PLANNING AND DEVELOPMENT
SERVICES DEPARTMENT

FEBRUARY 5, 2002

ELECTRICAL CODE AMENDMENTS

ORDINANCE NO. 3413

AN ORDINANCE OF THE COUNCIL OF THE CITY OF SCOTTSDALE, MARICOPA COUNTY, ARIZONA, AMENDING CHAPTER 31, ARTICLE IV OF THE SCOTTSDALE REVISED CODE, RELATING TO THE ELECTRICAL CODE; ADOPTING THE 1999 EDITION OF THE NATIONAL ELECTRICAL CODE, INCLUDING UNIFORM ADMINISTRATIVE CODE PROVISIONS AND ADOPTING REVISIONS THERETO.

BE IT ORDAINED by the City Council of the City of Scottsdale, Arizona, as follows:

Section 1. Section 31-46 of the Scottsdale Revised Code is hereby repealed and replaced by a new Section 31-46, which shall read as follows:

Sec. 31-46. Adoption.

The National Electrical Code, 1999 Edition, as published by the National Fire Protection Association and the ICC Electrical Code Administrative Provisions, as published by the International Conference of Building Officials, is adopted by reference and shall be the electrical code of the city. Three (3) copies of same shall at all times remain in the office of the city clerk and be open to inspection.

Section 2. Section 31-47 of the Scottsdale Revised Code is hereby repealed and replaced by a new Section 31-47, which shall read as follows:

Sec. 31-47. Amendments.

(a) The ICC Electrical Code Administrative Provisions are amended in the following respects:

1) Where reference is made to the "International Building Code," substitute "Scottsdale Revised Code, Chapter 31, Article III".

2) Where reference is made to the "International Residential Code," substitute "Scottsdale Revised Code, Chapter 31, Article III".

3) Where reference is made to the "International Fire Code," substitute "Scottsdale Revised Code, Chapter 36, Article II".

4) Where reference is made to any section of the "International Mechanical Code," substitute "Scottsdale Revised Code, Chapter 31, Article VI".

5) Section 101.1 is amended to read :

Section 101.1 Title. These regulations shall be known as the Electrical Code of the City of Scottsdale and shall be cited as such and will be referred to herein as "this code".

6) Section 102.6 is amended to read :

Section 102.6 Referenced Codes and Standards. The codes and standards referenced in this code shall be those that are listed in Chapter 13, and in Scottsdale Revised Code Chapter 31, Article III, and such codes and standards shall be considered part of the requirements of this code to the prescribed extent of each such reference. Where differences occur between provisions of this code and referenced codes or standards, the provisions of this code shall apply.

7) Section 201.3 is amended to read :

Section 201.3 Terms defined in other codes. Where terms are not defined in this code and are defined in NFPA 70 or Scottsdale Revised Code Chapter 31, Article III, such terms shall have meanings ascribed to them as in those codes.

8) Delete Section 301 and substitute the following :

Section 301 Electrical inspections shall be performed as set forth in Scottsdale Revised Code Chapter 31, Article III.

9) Delete Section 302 and substitute the following :

Section 302 Duties and Powers of the Building Official shall be as set forth in Scottsdale Revised Code Chapter 31, Article III.

10) Delete Section 303 and substitute the following :

Section 303 Certificate of occupancy shall be as set forth in Scottsdale Revised Code Chapter 31, Article III.

11) Section 402.5 is amended to read :

Section 402.5 Time limitation of application. An application for a permit for any proposed work or operation shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the code official is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

12) Section 403.3 is amended to read :

Section 403.3 Extensions. The code official is authorized to grant, in writing, one or more extensions of the time period of a permit for periods of not more than 180 days each. Such extensions shall be requested by the permit holder in writing and justifiable cause demonstrated.

13) Delete Section 404.2 and substitute the following :

Section 404.2 Schedule of permit fees. Fees for each permit shall be paid as set forth in Scottsdale Revised Code Chapter 46, Article VII.

14) Delete Section 504.3 and substitute the following :

Section 504.3 Retention of construction documents shall be as set forth in Scottsdale Revised Code Chapter 31, Article III.

15) Delete Chapter 11 and substitute the following :

Chapter 11 Means of Appeal shall be as set forth in Scottsdale Revised Code Chapter 31, Article III.

16) Section 1202.13 : Delete exception 2.

17) Section 1202.14 : Delete exceptions 1 and 2.

18) Section 1203 : Delete in entirety.

(b) The Code Provisions for the 1999 Edition of the National Electrical Code are amended in the following respects:

1) Section 210-8 is amended to read:

210-8. Ground-Fault Circuit-Interrupter Protection for Personnel
Fine Print Note: See Section 215-9 for ground-fault circuit-interrupter protection for personnel on feeders.

(a) All Occupancies. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified below shall have ground-fault circuit-interrupter protection for personnel.

1. Bathrooms.
2. Garages, and also accessory buildings that have a floor located at or below grade level not intended as habitable rooms and limited to storage areas, work areas, and areas of similar use.
   Exception No. 1: Receptacles that are not readily accessible.
   Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another, and that is cord- and plug-connected in accordance with Section 400-7(a)(6), (a)(7), or (a)(8).
   Receptacles installed under the exceptions to Section 210-8(a)(2) shall not be considered as meeting the requirements of Section 210-52(g).
3. Outdoors.
   Exception: Receptacles that are not readily accessible and are supplied by a dedicated branch circuit for electric snow-melting or deicing equipment shall be permitted to be installed in accordance with the applicable provisions of Article 426.
4. Crawl spaces. Where the crawl space is at or below grade level.
5. Unfinished basements. For purposes of this section, unfinished basements are defined as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and the like.
   Exception No. 1: Receptacles that are not readily accessible.
   Exception No. 2: A single receptacle or a duplex receptacle for two appliances located within dedicated space for each appliance that, in normal use, is not easily moved from one place to another, and that is cord- and plug-connected in accordance with Section 400-7(a)(6), (a)(7), or (a)(8).
   Receptacles installed under the exceptions to Section 210-8(a)(5) shall not be considered as meeting the requirements of Section 210-52(g).
6. Kitchens. Where the receptacles are installed to serve the countertop surfaces.
7. Wet bar sinks. Where the receptacles are installed to serve the countertop surfaces and are located within 6 ft (1.83 m) of the outside edge of the wet bar sink. Receptacle outlets shall not be installed in a face-up position in the work surfaces or countertops.

8. Within 6 ft. (1.83m) of any sink, wash basin, tub or shower.

2) Add New Section 230-63 to read:

230-63. Location. All service equipment rated 1000 amperes or more located inside a building shall be enclosed within a room or space separated from the rest of the building by not less than one-hour fire-resistive occupancy separation.

3) Section 240-86 is revised to read:

240-86. Series Ratings.
A circuit breaker shall be permitted to be used on a circuit having an available fault current higher than its marked interrupting rating by being connected on the load side of an acceptable overcurrent protective device having the higher rating, under conditions specified in (a) or (b) or (c), and (d).

(a) Selected Under Engineering Supervision. The line-side current-limiting device is selected under engineering supervision for load-side circuit breakers, which are passive during the first half cycle of a fault. This additional series combination rating, including identification of the upstream current-limiting device shall be field marked on the end-use equipment.

(b) Tested Combinations. The combination of the line-side overcurrent device and load-side circuit breaker(s) is tested and marked on the end-use equipment, such as switchboards and panelboards.

(c) Existing Buildings. In existing buildings where the tested combinations in (b) above are not marked, one of the following conditions shall apply.

(1) The end-use equipment manufacturer shall investigate the equipment for conformance with the product test standard and, where applicable, field mark the equipment with the recognized combinations of series rated devices. Any field markings applied shall comply with the requirements of the end-use equipment manufacturer and shall bear the name and/or trademark of the manufacturer.
(2) Where the combination of series rated devices are marked, but not all combinations are shown, the end-use equipment manufacturer shall investigate the equipment and, where applicable, field mark the equipment with the additional recognized combinations of series rated devices. Any field markings applied shall comply with the requirements of the end-use equipment manufacturer and shall bear the name and/or trademark of the manufacturer.
(3) Under electrical supervision, the combinations of series rated devices in the end-use equipment shall be permitted to be field evaluated for conformance with the manufacturer's requirements. The end-use equipment shall be field marked with the additional

recognized combinations of series rated devices. The field markings applied shall be permanent, legible and visible, and bear the name of the engineer evaluating the system. The marking shall state
"The combinations of series rated devices was field evaluated by (*name of Arizona registered electrical engineer*) and determined to be safe for use and in accordance with the manufacturer's requirements."

(d) Motor Contribution. Series ratings shall not be used where
1. Motors are connected on the load side of the higher-rated overcurrent device and on the line side of the lower-rated overcurrent device, and
2. The sum of the motor full-load currents exceeds 1 percent of the interrupting rating of the lower-rated circuit breaker.

4) Section 250-118 is revised to read:

250-118. Types of Equipment Grounding Conductors
The equipment grounding conductor run with or enclosing the circuit conductors shall be one or more or a combination of the following:

1. A copper or other corrosion-resistant conductor. This conductor shall be solid or stranded; insulated, covered, or bare; and in the form of a wire or a busbar of any shape.
2. Rigid metal conduit.
3. Intermediate metal conduit.
4. Electrical metallic tubing with an individual equipment grounding conductor.
5. Flexible metal conduit with an individual equipment grounding conductor and where both the conduit and fittings are listed for grounding.
6. Listed flexible metal conduit that is not listed for grounding, with an individual equipment grounding conductor, and meeting all the following conditions.
   a. The conduit is terminated in fittings listed for grounding.
   b. The circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
   c. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).
   d. The conduit is not installed for flexibility.
7. Listed liquidight flexible metal conduit with an individual equipment grounding conductor and meeting all the following conditions.
   a. The conduit is terminated in fittings listed for grounding.
   b. For trade sizes 3/8 in. through ½ in., the circuit conductors contained in the conduit are protected by overcurrent devices rated at 20 amperes or less.
   c. For trade sizes ¾ in. through 1¼ in., the circuit conductors contained in the conduit are protected by overcurrent devices

rated not more than 60 amperes and there is no flexible metal conduit, flexible metallic tubing, or liquidtight flexible metal conduit in trade sizes 3/8 in. or ½ in. in the grounding path.

d. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).

e. The conduit is not installed for flexibility.

8. Flexible metallic tubing with an individual equipment grounding conductor and where the tubing is terminated in fittings listed for grounding and meeting all the following conditions.
   a. The circuit conductors contained in the tubing are protected by overcurrent devices rated at 20 amperes or less.
   b. The combined length of flexible metal conduit and flexible metallic tubing and liquidtight flexible metal conduit in the same ground return path does not exceed 6 ft (1.83 m).
9. Armor of Type AC cable with an individual equipment grounding conductor and as provided in Section 333-21.
10. The copper sheath of mineral-insulated, metal-sheathed cable.
11. The metallic sheath of Type MC cable with an individual equipment grounding conductor.
12. Cable trays as permitted in Sections 318-3(c) and 318-7.
13. Cablebus framework as permitted in Section 365-2(a).
14. Other electrically continuous metal raceways listed for grounding.

5) Section 310-15(b)(6) is revised to read:

310-15(b)(6). 120/240-Volt and 120/208-Volt, 3-Wire, Single-Phase Dwelling Services and Feeders. For dwelling units, conductors, as listed in Table 310-15(b)(6), shall be permitted as 120/240-volt and 120/208 volt, 3-wire, single-phase-service-entrance conductors, service lateral conductors, and feeder conductors that serve as the main power feeder to a dwelling unit and are installed in raceway or cable with or without an equipment grounding conductor. For application of this section, the main power feeder shall be the feeder(s) between the main disconnect and the lighting and appliance branch-circuit panelboard(s), and the feeder conductors to a dwelling unit shall not be required to be larger than their service-entrance conductors. The grounded conductor shall be permitted to be smaller than the ungrounded conductors, provided the requirements of Sections 215-2, 220-22, and 230-42 are met.

Table 310-15(b)(6). Conductor Types and Sizes for 120/240-Volt and 120/208-Volt, 3-Wire, Single-Phase-Dwelling Services and Feeders.
Conductor Types RH, RHH, RHW, RHW-2, THHN, THHW, THW, THW-2, THWN, THWN-2, XHHW, XHHW-2, SE, USE, USE-2

Conductor (AWG or kcmil)

Copper	Aluminum or Copper-Clad Aluminum	Service or Feeder Rating (Amperes) ≤ 30°C (86°F)	> 30°C (86°F)
4	2	100	----
3	1	110	----
2	1/0	125	100
1	2/0	150	125
1/0	3/0	175	150
2/0	4/0	200	175
3/0	250	225	200
4/0	300	250	225
250	350	300	250
350	500	350	300
400	600	400	350
500	750	----	400

CAUTION - UTILITY COMPANY CONDUCTOR SIZE REQUIREMENTS MAY VARY. CONSULT WITH SERVING UTILITY PRIOR TO INSTALLATION.

6) Section 336-4 is revised to read:

336-4. Uses Permitted
Type NM, Type NMC, and Type NMS cables shall be permitted to be used in the following:

1. One- and two-family dwellings, multifamily dwellings, and other residential accessory structures

FPN: See Section 310-10 for temperature limitation of conductors.

(a) Type NM. Type NM cable shall be permitted for both exposed and concealed work in normally dry locations. It shall be permissible to install or fish Type NM cable in air voids in masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness.

(b) Type NMC. Type NMC cable shall be permitted as follows:

1. For both exposed and concealed work in dry, moist, damp, or corrosive locations
2. In outside and inside walls of masonry block or tile
3. In a shallow chase in masonry, concrete, or adobe protected against nails or screws by a steel plate at least 1/16-in. (1.59-mm) thick, and covered with plaster, adobe, or similar finish

(c) Type NMS. Type NMS cable shall be permitted for both exposed and concealed work in normally dry locations. It

shall be permissible to install or fish Type NMS cable in air voids in masonry block or tile walls where such walls are not exposed or subject to excessive moisture or dampness. Type NMS cable shall be used as permitted in Article 780.

336-5. Uses Not Permitted

(a) Types NM, NMC, and NMS. Types NM, NMC, and NMS cables shall not be used in the following:

1. In any multifamily dwelling or other structure exceeding three floors above grade

For the purpose of this article, the first floor of a building shall be that floor that has 50 percent or more of the exterior wall surface area level with or above finished grade. One additional level that is the first level and not designed for human habitation and used only for vehicle parking, storage, or similar use shall be permitted.

2. As service-entrance cable
3. embedded in poured cement, concrete, or aggregate

(b) Types NM and NMS. Types NM and NMS cable shall not be installed in the following:

1. Where exposed to corrosive fumes or vapors
2. Where embedded in masonry, concrete, adobe, fill, or plaster
3. In a shallow chase in masonry, concrete, or adobe and covered with plaster, adobe, or similar finish

7) Article 810 is amended by adding Item E to read:

"E. PUBLIC SAFETY RADIO AMPLIFICATION SYSTEM.

810-80. RADIO COVERAGE. Except as otherwise provided, no person shall erect, construct or modify any building or structure or any part thereof, or cause the same to be done which fails to support adequate radio coverage for city emergency service workers, including but not limited to firefighters and police officers. A certificate of occupancy may not be issued for any building or structure which fails to comply with this requirement.

The frequency range which must be supported for police communications shall be 806 mhz to 869 mhz, or as required by the City of Scottsdale police department. The frequency range which must be supported for fire department communications shall be 153 mhz to 155 mhz, or as required by the City of Scottsdale fire department.

For purposes of this section, adequate radio coverage shall include all of the following:

(a) A minimum signal strength of one (1) microvolt available in 85% of the area of each floor of the building when transmitted from the City of Scottsdale communications systems.

(b) A minimum signal strength of one (1) microvolt received at the City of Scottsdale communications systems when transmitted from 85% of the area of each floor.

(c) A 90% reliability factor.

The building official may require that sufficient evidence or proof be submitted to substantiate compliance with this provision of the code before a building permit is issued. The plans and specifications, and other data, filed by an applicant for permit shall be reviewed by the building official. Such plans may be reviewed by other departments of this jurisdiction to verify compliance with this provision of the code.

810-81. ENHANCED AMPLIFICATION SYSTEMS. Buildings and structures over thirty-five (35) feet in height, buildings with below grade spaces or parking, and other buildings where required to provide adequate signal strength, shall be equipped with any of the following to achieve the required adequate radio coverage: radiating cable system(s) or internal multiple antenna system(s) with 800 mhz and 150 mhz amplification system(s) as needed. If any part of the installed system or systems contains an electrically powered component, the system shall be capable of operating on an independent battery and/or generator system for a period of at least two (2) hours without external power input. The battery system shall automatically charge in the presence of an external power input.

810-82. TESTING PROCEDURES.

(a) INITIAL TESTS: The building official may require tests as evidence of compliance to be made at no expense to this jurisdiction, to be performed by the installer in the presence an agent of the City of Scottsdale. A certificate of occupancy may not be issued for any building or structure which fails to comply with this test.

(b) ANNUAL TESTS: will be conducted by the City of Scottsdale fire department and/or the City of Scottsdale police department in conjunction with inspection procedures.

810-83. USES WHERE NOT REQUIRED. This section shall not apply to any single-family residence. The requirements of this section may be waived by the building official for buildings which do not have below grade spaces or parking."

PASSED AND ADOPTED BY THE Council of the City of Scottsdale this _____ day of _____, 2002.

_____
Mary Manross, Mayor

ATTEST:
Sonia Robertson
City Clerk

BY _____
Sonia Robertson, City Clerk

APPROVED AS TO FORM:

_____
David Pennartz, City Attorney